CREATE EW3 Project

Air Quality Technical Documentation

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The CREATE EW3 project is located in Chicago, Illinois within Cook County limits. The project extends from the junction of the SCIH with the BRC main line at Rock Island Junction near 95th Street and Commercial Avenue, through the Pullman Junction area near 95th Street and Stony Island Avenue, to the Dan Ryan Expressway along the BRC main line. A portion of the project extends south along the NS Chicago District through Calumet Yard, terminating south of 110th Street. Following is a succinct list of improvements included in the EW3 Build Alternative:

- Reconfiguration of Pullman Junction to incorporate a new NS mainline track between Rock Island Junction and Pullman Junction.
- Installation of power-operated turnouts and crossovers connecting BRC and NS mainlines at Pullman Junction.
- Upgrading signal systems along BRC and NS rail lines as necessary to facilitate operations on the realigned track and proposed crossovers.
- Installation of a retaining wall north of the BRC near 94th Street to support the proposed improvements.
- Bridge improvements at Commercial Avenue to support the proposed improvements.
- Rearrangement of CRL and SCIH trackage and turnouts along with realignment and use of CRL and SCIH property necessary to construct and operate the proposed improvements.

Microscale Analysis

Changes in air quality due to the CREATE program were evaluated according to the April 2011 CREATE Air Quality Methodology. The following pollutants were analyzed: hydrocarbons (HC), carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter (PM), and sulfur dioxide (SO_2. The overall CREATE project will result in the maintenance of National Ambient Air Quality Standards (NAAQS) in the Chicago region.

Air emissions from operations of the CREATE EW3 project were estimated using 2009 and 2029 locomotive emission factors developed by the U.S. Environmental Protection Agency for HC, CO, NO_x, particulate matter with a diameter less than 10 microns (PM_{10}), particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$), and SO_2. Fuel consumption estimates provided by the Chicago Transportation Coordination Office (CTCO) were also used in the analysis. Annual air emissions were compared for Existing Condition (2009), 2029 Build Alternative, and 2029 No-Build Alternative. The results of the analysis are found below in Table 1:

Table 1: CREATE EW3 Locomotive Air Emissions

Year	Pollutant (in tons per year)					
	HC	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2
2009 Existing Condition	3.820	11.165	72.195	2.057	1.995	6.854
2029 Build Alternative	2.870	31.809	76.534	1.555	1.508	0.117
2029 No-Build Alternative	1.636	18.129	43.620	0.886	0.859	0.067

There is a net increase in fuel use from 2009 to 2029, under both the Build and No-Build Alternative. This is primarily due to the large projected increase in the number of trains in the EW3 project area under the Build Alternative. For some pollutants (CO, NOx), emissions are higher in the 2029 Build Alternative compared with the Existing Condition because the increase in fuel use is not completely offset by improvements in emission factors for these pollutants. For the other pollutants, the differences between the Existing Condition and the 2029 Build Alternative can be attributed to a combination of improvements in emission factors due to the reformulations in fuel offsetting an increase in fuel use.

General Conformity

A General Conformity analysis was undertaken on this proposed improvement for Hydrocarbons (HC), Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Particulate Matter with a diameter less than 10 microns

(PM_{10}), Particulate Matter with a diameter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). In addition to the General Conformity pollutants, the remaining criteria air pollutants were analyzed to provide a complete assessment of air emissions in accordance with EPA 40 CFR Parts 51 and 93. Project related emissions were analyzed for the construction year (2015) with the greatest anticipated construction activity and emissions, and for the project's design year. The project-related emissions for the conformity-related pollutants for these two time-frames were then compared to the 100 ton per year per pollutant thresholds that apply for these pollutants in the Chicago area.

Construction equipment type and associated operations hours required to accomplish the construction activities in that year were estimated for the construction year with the greatest construction emissions. Equipment types with their associated horsepower were then cross-referenced to emission factors generated from USEPA's "NonRoad2008a" model. The emission factors are based on an average fleet age for the specific year being analyzed. Emission factors for light duty gas trucks (LDGTs) associated with construction emissions were generated from USEPA's "MOVES2010b" model.

In some cases, the equipment's exact horsepower was not included on the emission factor table for that type of equipment. In those cases, the closest horsepower was utilized to obtain emission factors. If the equipment's horsepower was not specified, the horsepower and associated emission factor that would most likely produce the worst case scenario for emissions was utilized. In cases where the equipment type was not included in the construction equipment table, emission factors for representative pieces of equipment with the specified horsepower were utilized.

Previously, the USEPA MOBILE 6.2 model was used to generate emissions for on-road vehicles. In December 2010, the USEPA mandated that the MOVES 2010 model be used for quantitative analyses for transportation conformity purposes. The grace period for this implementation ended on December 2012. For the CREATE EW3 project, this only applies to LDGTs. It was therefore necessary to generate emission factors for LDGTs using the MOVES2010b model. The following information describes the assumptions and process used to generate the emission factors for the LDGTs. This process was presented to and approved by the Tier II Consultation Committee of the Chicago Metropolitan Agency for Planning on October 24, 2013.

Inputs/Assumptions

- Default National Inputs for Cook County, Illinois (2015)
- Time Span – Annual (January through December)
- Hours: 8:00am to 6pm (to emulate average hours per working day)
- Vehicles (Gasoline – Light Commercial Trucks, Gasoline – Passenger Trucks, MOVES SourceUseTypes 31 and 32)
- Road Types – Rural Restricted Access, Rural Unrestricted Access, and Urban Unrestricted Access (RoadTypes 2, 3, and 5)
- Pollutants: Total Gaseous Hydrocarbons (HC), Carbon Monoxide (CO), Oxides of Nitrogen (NOx), PM10 (Total Exhaust, Brakewear, and Tirewear), PM2.5 (Total Exhaust, Brakewear, and Tirewear), Sulfur Dioxide (SO2)

MOVES2010b Output

- At National Output, model generates emission rates (grams/mile) for each pollutant for each hour included as input and for all speed bins (SpeedBins 1 to 16 = 2.5 mph to 75 mph)

Output Post-Processing

- Output file was sorted by SpeedBin and all SpeedBins eliminated except for SpeedBinID = 3 (7.5 mph to 12.5 mph; most closely matches 10mph speed using MOBILE 6.2 factors).
- For each pollutant emission rates averaged for the year, for the hours included in the model (8:00am to 6:00 pm)

MOVES2010b Emission Rates (grams/mile) for EW3 LDGTs

- HC: 0.120
- CO: 2.827
- NOx: 0.427
- SO2: 0.00626
- PM10: 0.03996
- PM2.5: 0.01499

Operation emissions were not included in the emissions calculations for the construction year with the greatest construction emissions. This is a worst case scenario because it assumes that operations would essentially remain unchanged during the construction operations. It is more likely that some train operations would be diverted to avoid the construction activities in which case operational emissions would actually be lower during construction than if construction was not occurring, and the calculations do not include the emission reduction due to reduced operations during construction.

Emissions resulting from the change in operations in the design year are calculated from fuel consumption information based on a train traffic simulation model that projects operations for the design year in both a no-build and a build scenario. An average number of locomotives and railcars for each train were assumed. Only the additional emissions resulting from the implementation of the project are included in the analysis.

The General Conformity and other pollutant emissions analysis is presented in Table 2. The analysis demonstrated that the project emissions for assessed pollutants are less than the applicable 100 ton/year DeMinimis threshold level for General Conformity pollutants (40 CFR 93 § 153). For this reason, this project is not required by the Illinois' General Conformity regulations to complete a full General Conformity determination.

Table 2: EW3 GENERAL CONFORMITY ANALYSIS

Construction Year Analysis						
	Tons/Yr					
	HC	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2
Construction Emissions 2015	0.931	4.124	7.365	0.679	0.663	0.009
Threshold	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000
Does Construction YR Total Emissions Exceed Threshold?	N	N	N	N	N	N

Design Year Analysis						
	Tons/Yr					
	HC	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2
Operation Emissions 2029 No-Build	1.636	18.129	43.620	0.886	0.859	0.067
Operation Emissions 2029 Build	2.870	31.809	76.534	1.555	1.508	0.117
Delta Emissions due to build	1.2343	13.6800	32.9144	0.6686	0.6485	0.0504
Threshold	100.0000	100.000	100.0000	100.0000	100.0000	100.000
Does Design YR Delta Exceed Threshold?	N	N	N	N	N	N

Mobile Source Air Toxics

The U.S. Environmental Protection Agency (USEPA) regulates Mobile Source Air Toxics (MSATs). MSATS are compounds emitted from highway vehicles and non-road equipment (e.g. locomotives and construction vehicles) that have the potential to cause adverse health effects. Since the CREATE EW3 Project would improve freight rail operations, this project was classified as a project with low potential MSAT emissions. Since emissions are directly related to fuel usage, the fuel usage for each alternative was compared.

For the Build Alternative, the amount of MSATs emitted would be proportional to the amount of fuel used assuming that other variables (such as travel not associated with the project) are the same for each alternative. The estimated fuel usage for the Build Alternative is approximately 57% less than the No-Build Alternative (see Table 3). This decreased fuel usage is associated with the reduction in time it would take trains to operate within or traverse the project corridor and/or the reduction in the time trains spend idling.

Table 3: FUEL CONSUMPTION DATA FROM CTCO TRAIN MODEL[1]

Alternative	Fuel Consumption (Gallons) (96 hours)
Existing	4,173
No Build Alternative (2029)	11,889
CREATE Build Alternative (2029)[2]	6,776

Notes:
[1] The fuel consumption data from the CTCO Train Model is for the CREATE EW3 Project corridor only.
[2] The CREATE Build Alternative evaluates the implementation of the entire CREATE Program.

The additional freight rail activity contemplated as part of the Build Alternative could have the effect of increasing diesel emissions in the vicinity of homes, schools, and businesses. Therefore, under the Build Alternative, there may be localized areas where ambient concentrations of MSATs would be higher than under the No-Build Alternative. However, the magnitude and duration of these potential increases cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific health impacts. Even though there may be differences among the alternatives, on a region-wide basis, USEPA's non-road emission regulations, coupled with locomotive turnover and re-builds, will cause

substantial reductions over time and in almost all cases, the MSAT levels will be significantly lower than today.

INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a project. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The USEPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The USEPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways and other transportation facilities; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the USEPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control

technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires USEPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld USEPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

CREATE Project EW3
Air Quality Results provided by CTCO
4-22-13
96 Hours (four average weekdays)

Options	**Fuel (Gallons)**
Current Operation	4,173
CREATE Build Option - Year 2029	11,889
No Build Option – Year 2024*	6,776

*Per IDOT: No-Build Emissions for 2029 are considered the same as for 2024

CREATE COMPONENT PROJECT EQUIPMENT REQUIREMENTS FOR EMISSIONS CALCULATIONS
PROJECT: EW3
YEAR OF GREATEST CONSTRUCTION ACTIVITY: 2015
PROVIDED BY: D.M. Tichy/Norfolk Southern Railroad
DATE: 6/13/2013

Please identify on this sheet each piece of railroad or construction equipment to be used and the total hours that this type of equipment will be operated during the year of greatest construction activity. If exact piece is not shown, pick one with an equal or nearly equal horsepower. Note: all equipment is Diesel powered unless otherwise shown.

EQUIPMENT	HORSEPOWER	HOURS/YEAR ALL PIECES
Specialized Railroad Equipment		
Ballast Compactors	94	
Ballast Regulators	83	
	92	
	104	
	117	
	185	
	200	
	232	
	275	
	300	480
Ballast Tampers (all types)	28	
	76	
	83	
	105	
	118	
	125	
	140	
	155	
	158	
	174	
	232	
	240	
	250	
	260	
	350	
	385	
	425	
	466	480
On Track Tie Handlers	47	
	64	
	80	
	100	
	125	240
Portable Rail Drills	3	120

Portable Rail Grinders (gas)	1	120
Portable Rail Grinders (gas)	7	
Portable Rail Saws (gas)	1	120
Rail Lifters (gas)	8	
	23	
Self-Propelled Adzers	42	
Self-Propelled Anchor Applicators	23	
	38	
	47	
	70	240
Self-Propelled Applicators	38	
	100	
Self-propelled Driver/Setters	36	
	42	
	100	240
Self-Propelled Pullers	17	
	27	
	30	
	42	
	70	
	80	
Self-Propelled Rail Saws	30	
	88	
Self-Propelled Track Brooms	48	
	100	
	117	
	185	480
Tie Remover/Inserters	74	
	76	
	85	
	125	
	170	
	175	
	185	240
Work trains	1500	
Brandt Power Units	200	
	250	
	300	
Car Movers	150	
Electric Welders	40	240
Other - not listed (enter below)		
General Construction Eqpt		
Augurs - Truck Mounted	50	
Backhoes	100	
	400	960
Backhoes/Loaders	250	
Bulldozers	300	
Drilling Equipment	500	

Compactors	8	
	15	
	25	
Compressors - Air	100	480
Compressors - Hydraulic	150	
Cranes	100	480
	130	
	150	
	155	
	200	
	210	
	250	
	270	
	275	
	300	
	400	
	600	
	750	
Excavators	250	
	300	
	500	120
	100	
Generators	100	
	200	
Graders	200	
	500	
Loaders	150	
	250	120
Lowboys	500	80
Miscellaneous Equipment	150	240
Mixers	20	
	50	
Pumps	25	
	120	
	500	
Rollers/Compactors	110	
	350	120
Saws - Concrete/Pavement	50	
Scrapers	300	
	500	
Sheet Pile Driving Equipment	250	
Speed Swings (specify HP)		
Trucks - Construction	300	
	400	960
	500	960
Haul Trucks	Off-Site	
Light Duty Vehicles	Off-Site	
	On-Site	960
Buses	On-Site	
Non-road vehicles	On-Site	

Project EW3
Construction Year 2015

Emission Calculations for Hydrocarbons

Equipment	HP	HR/YR	EF g/hp-hr[a]	Grams/YR	Tons/YR
Specialized Railroad Equipment					
Ballast Regulators	300	480	0.701	100896	0.111
Ballast Tampers	466	480	0.622	139023	0.153
On Track Tie Handlers	125	240	0.779	23378	0.026
Portable Rail Drills	3	120	1.074	387	0.000
Portable Rail Grinders	1	120	1.074	129	0.000
Portable Rail Saws	1	120	1.074	129	0.000
Self-propelled Anchor Applicators	70	240	1.034	17378	0.019
Self-propelled Driver/Setters	100	240	1.077	25840	0.028
Self-propelled Track Brooms	185	480	0.701	62219	0.069
Tie Remover/Inserters	185	240	0.701	31110	0.034
Electric Welders	40	240	0.588	5646	0.006
General Construction Equipment					
Backhoes	400	960	0.593	227703	0.251
Air Compressors	100	480	0.314	15051	0.017
Cranes	100	480	0.259	12419	0.014
Excavators	500	120	0.160	9608	0.011
Loaders	250	120	0.593	17789	0.020
Lowboys	500	80	0.231	9259	0.010
Miscellaneous Equipment	150	240	0.245	8830	0.010
Rollers/Compactors	350	120	0.191	8031	0.009
Construction Trucks	400	960	0.149	57210	0.063
Construction Trucks	500	960	0.149	71512	0.079
	mph[b]	**HR/YR**	**EF g/mi[c]**	**Grams/YR**	**Tons/YR**
Light Duty Vehicles (LDGT) (On-site)	10	960	0.120	1152	0.001
Total Tons/Yr Construction Emissions					**0.931**

[a] Emission factor taken from EPA's NONROAD 2008a model as summarized by CONSTILL1217.xls.
[b] Traveling speed assumed to be 55 miles per hour for off-site vehicles and 10 miles per hour for on-site vehicles.
[c] Emission factor taken from EPA's MOVES2010b model.

Project EW3
Construction Year 2015

Emission Calculations for Carbon Monoxide

Equipment	HP	HR/YR	EF g/hp-hr[a]	Grams/YR	Tons/YR
Specialized Railroad Equipment					
Ballast Regulators	300	480	2.746	395473	0.436
Ballast Tampers	466	480	3.261	729510	0.804
On Track Tie Handlers	125	240	3.199	95962	0.106
Portable Rail Drills	3	120	7.275	2619	0.003
Portable Rail Grinders	1	120	7.275	873	0.001
Portable Rail Saws	1	120	7.275	873	0.001
Self-propelled Anchor Applicators	70	240	5.569	93559	0.103
Self-propelled Driver/Setters	100	240	6.169	148065	0.163
Self-propelled Track Brooms	185	480	2.746	243875	0.269
Tie Remover/Inserters	185	240	2.746	121937	0.134
Electric Welders	40	240	2.894	27785	0.031
General Construction Equipment					
Backhoes	400	960	2.116	812684	0.896
Air Compressors	100	480	2.858	137182	0.151
Cranes	100	480	1.733	83173	0.092
Excavators	500	120	0.886	53137	0.059
Loaders	250	120	2.116	63491	0.070
Lowboys	500	80	1.560	62391	0.069
Miscellaneous Equipment	150	240	1.106	39833	0.044
Rollers/Compactors	350	120	1.210	50811	0.056
Construction Trucks	400	960	0.637	244473	0.269
Construction Trucks	500	960	0.637	305591	0.337

	mph[b]	HR/YR	EF g/mi[c]	Grams/YR	Tons/YR
Light Duty Vehicles (LDGT) (On-site)	10	960	2.827	27139	0.030

Total Tons/Yr Construction Emissions **4.124**

[a] Emission factor taken from EPA's NONROAD 2008a model as summarized by CONSTILL1217.xls.

[b] Traveling speed assumed to be 55 miles per hour for off-site vehicles and 10 miles per hour for on-site vehicles.

[c] Emission factor taken from EPA's MOVES2010b model.

Project EW3
Construction Year 2015

Emission Calculations for Nitrogen Oxides

Equipment	HP	HR/YR	EF g/hp-hr[a]	Grams/YR	Tons/YR
Specialized Railroad Equipment					
Ballast Regulators	300	480	4.645	668939	0.737
Ballast Tampers	466	480	4.831	1080526	1.191
On Track Tie Handlers	125	240	4.904	147115	0.162
Portable Rail Drills	3	120	5.084	1830	0.002
Portable Rail Grinders	1	120	5.084	610	0.001
Portable Rail Saws	1	120	5.084	610	0.001
Self-propelled Anchor Applicators	70	240	5.348	89853	0.099
Self-propelled Driver/Setters	100	240	5.032	120779	0.133
Self-propelled Track Brooms	185	480	4.645	412513	0.455
Tie Remover/Inserters	185	240	4.645	206256	0.227
Electric Welders	40	240	4.634	44490	0.049
General Construction Equipment					
Backhoes	400	960	4.099	1573980	1.735
Air Compressors	100	480	3.240	155506	0.171
Cranes	100	480	2.951	141657	0.156
Excavators	500	120	2.220	133172	0.147
Loaders	250	120	4.099	122967	0.136
Lowboys	500	80	3.581	143251	0.158
Miscellaneous Equipment	150	240	2.827	101758	0.112
Rollers/Compactors	350	120	2.988	125477	0.138
Construction Trucks	400	960	1.627	624872	0.689
Construction Trucks	500	960	1.627	781090	0.861

	mph[b]	HR/YR	EF g/mi[c]	Grams/YR	Tons/YR
Light Duty Vehicles (LDGT) (On-site)	10	960	0.427	4099	0.005

Total Tons/Yr Construction Emissions **7.365**

[a] Emission factor taken from EPA's NONROAD 2008a model as summarized by CONSTILL1217.xls.

[b] Traveling speed assumed to be 55 miles per hour for off-site vehicles and 10 miles per hour for on-site vehicles.

[c] Emission factor taken from EPA's MOVES2010b model.

Project EW3
Construction Year 2015

Emission Calculations for Particulate Matter

Equipment	HP	HR/YR	EF g/hp-hr[a]	Grams/YR	Tons/YR
Specialized Railroad Equipment					
Ballast Regulators	300	480	0.491	70756	0.078
Ballast Tampers	466	480	0.450	100718	0.111
On Track Tie Handlers	125	240	0.589	17663	0.019
Portable Rail Drills	3	120	0.776	279	0.000
Portable Rail Grinders	1	120	0.776	93	0.000
Portable Rail Saws	1	120	0.776	93	0.000
Self-propelled Anchor Applicators	70	240	0.855	14364	0.016
Self-propelled Driver/Setters	100	240	0.946	22714	0.025
Self-propelled Track Brooms	185	480	0.491	43633	0.048
Tie Remover/Inserters	185	240	0.491	21816	0.024
Electric Welders	40	240	0.499	4794	0.005
General Construction Equipment					
Backhoes	400	960	0.400	153635	0.169
Air Compressors	100	480	0.397	19067	0.021
Cranes	100	480	0.261	12550	0.014
Excavators	500	120	0.137	8220	0.009
Loaders	250	120	0.400	12003	0.013
Lowboys	500	80	0.218	8731	0.010
Miscellaneous Equipment	150	240	0.246	8859	0.010
Rollers/Compactors	350	120	0.173	7266	0.008
Construction Trucks	400	960	0.104	39962	0.044
Construction Trucks	500	960	0.104	49952	0.055

	mph[b]	HR/YR	EF g/mi[c]	Grams/YR	Tons/YR
Light Duty Vehicles (LDGT) (On-site)	10	960	0.040	384	0.000

Total Tons/Yr Construction Emissions **0.679**

[a] Emission factor taken from EPA's NONROAD 2008a model as summarized by CONSTILL1217.xls.

[b] Traveling speed assumed to be 55 miles per hour for off-site vehicles and 10 miles per hour for on-site vehicles.

[c] Emission factor taken from EPA's MOVES2010b model.

Project EW3
Construction Year 2015

Emission Calculations for Particulate Matter 2.5

Equipment	HP	HR/YR	EF g/hp-hr[a]	Grams/YR	Tons/YR
Specialized Railroad Equipment					
Ballast Regulators	300	480	0.477	68633	0.076
Ballast Tampers	466	480	0.437	97696	0.108
On Track Tie Handlers	125	240	0.571	17133	0.019
Portable Rail Drills	3	120	0.753	271	0.000
Portable Rail Grinders	1	120	0.753	90	0.000
Portable Rail Saws	1	120	0.753	90	0.000
Self-propelled Anchor Applicators	70	240	0.829	13933	0.015
Self-propelled Driver/Setters	100	240	0.918	22032	0.024
Self-propelled Track Brooms	185	480	0.477	42324	0.047
Tie Remover/Inserters	185	240	0.477	21162	0.023
Electric Welders	40	240	0.484	4650	0.005
General Construction Equipment					
Backhoes	400	960	0.400	153635	0.169
Air Compressors	100	480	0.385	18495	0.020
Cranes	100	480	0.254	12174	0.013
Excavators	500	120	0.133	7974	0.009
Loaders	250	120	0.388	11643	0.013
Lowboys	500	80	0.212	8469	0.009
Miscellaneous Equipment	150	240	0.239	8594	0.009
Rollers/Compactors	350	120	0.168	7048	0.008
Construction Trucks	400	960	0.101	38763	0.043
Construction Trucks	500	960	0.101	48454	0.053

	mph[b]	HR/YR	EF g/mi[c]	Grams/YR	Tons/YR
Light Duty Vehicles (LDGT) (On-site)	10	960	0.015	135	0.000

Total Tons/Yr Construction Emissions **0.663**

[a] Emission factor taken from EPA's NONROAD 2008a model as summarized by CONSTILL1217.xls.

[b] Traveling speed assumed to be 55 miles per hour for off-site vehicles and 10 miles per hour for on-site vehicles.

[c] Emission factor taken from EPA's MOVES2010b model.

Project EW3
Construction Year 2015

Emission Calculations for Sulfur Dioxide

Equipment	HP	HR/YR	EF g/hp-hr[a]	Grams/YR	Tons/YR
Specialized Railroad Equipment					
Ballast Regulators	300	480	0.005	766	0.001
Ballast Tampers	466	480	0.005	1194	0.001
On Track Tie Handlers	125	240	0.005	162	0.000
Portable Rail Drills	3	120	0.006	2	0.000
Portable Rail Grinders	1	120	0.006	1	0.000
Portable Rail Saws	1	120	0.006	1	0.000
Self-propelled Anchor Applicators	70	240	0.006	102	0.000
Self-propelled Driver/Setters	100	240	0.006	144	0.000
Self-propelled Track Brooms	185	480	0.005	472	0.001
Tie Remover/Inserters	185	240	0.005	236	0.000
Electric Welders	40	240	0.006	57	0.000
General Construction Equipment					
Backhoes	400	960	0.005	2024	0.002
Air Compressors	100	480	0.005	239	0.000
Cranes	100	480	0.005	233	0.000
Excavators	500	120	0.004	257	0.000
Loaders	250	120	0.005	158	0.000
Lowboys	500	80	0.005	181	0.000
Miscellaneous Equipment	150	240	0.004	161	0.000
Rollers/Compactors	350	120	0.004	187	0.000
Construction Trucks	400	960	0.004	1555	0.002
Construction Trucks	500	960	0.004	1944	0.002

	mph[b]	HR/YR	EF g/mi[c]	Grams/YR	Tons/YR
Light Duty Vehicles (LDGT) (On-site)	10	960	0.001	91	0.000

Total Tons/Yr Construction Emissions **0.009**

[a] Emission factor taken from EPA's NONROAD 2008a model as summarized by CONSTILL1217.xls.

[b] Traveling speed assumed to be 55 miles per hour for off-site vehicles and 10 miles per hour for on-site vehicles.

[c] Emission factor taken from EPA's MOVES2010b model.

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Tier II Consultation Meeting

Minutes -October 24, 2013 and follow up phone call on November 1, 2013

Participants:

Michelle Allen	FHWA via phone
Reggie Arkell	FTA via phone
Patricia Berry,	CMAP
Bill Barbel	AECOM via phone
Mitch Barloga	NIRPC via phone
Frank Baukert	INDOT via phone
Claire Bozic	CMAP
Bruce Carmitchel	IDOT – Office of Planning & Programming
Teri Dixon	CMAP
John Donovan	FHWA
Gale Ferris	IDEM via phone
Matt Fuller	FHWA via phone
Kevin Garcia	NIRPC via phone
Jerry Halperin	INDOT via phone
Larry Heil	FHWA via phone
Greg Katter	INDOT via phone
Katie Kukielka	IDOT/AECOM
Alice Lovegrove	Parsons Brinckerhoff via phone
Kathy Luther	NIRPC via phone
Anthony Maietta	EPA Region 5
Adin McCann	HNTB
Jay Mitchell	INDOT via phone
Roy Nunnally	INDOT via phone
Steve Ott	Parson Brinckerhoff
Ross Patronsky	CMAP
Mark Pitstick	RTA
Curt Overcast	HDR via phone
Jim Pinkerton	INDOT via phone
Janice Reid	HDR
Mike Rogers	IEPA
Steve Schilke	IDOT
Ron Shimizu	Parsons Brinckerhoff
Chris Schmidt	IDOT – Office of Planning & Programming
Brian Smith	AECON via phone
Steve Strains	NIRPC via phone
Ed Tadross	Parsons Brinckerhoff via phone
Samuel Tuck III	IDOT
Scott Weber	NIRPC via phone
Andrew Williams-Clark	CMAP
Yamilee Volcy	FHWA

Walt Zyznieuski IDOT – via phone

1.0 Call to Order and Introductions

The meeting was called to order at 10:33 a.m.

2.0 Approval of Minutes – September 20, 2013

Approval of the September 20, 2013 minutes will be included on the agenda at next meeting.

3.0 Illiana $PM_{2.5}$ Hot Spot Analysis

Ms. Lovegrove discussed the revised and expanded report which highlighted changes in the $PM_{2.5}$ hot spot analysis report. The updated details include updating Tables 1 and 2, the preliminary projected 2040 and 2018 bi-directional AADT respectively. Ms. Lovegrove also wanted the committee's thoughts on two issues 1) monitors and 2) receptors. The Braidwood site was used as the background concentration monitor because it is more rural and more indicative of wind conditions, but Ms. Lovegrove said that the East Chicago monitor could be used also. The committee concurred that Braidwood was the appropriate site although consultants were willing to include East Chicago.

Mr. Patronsky asked which standard was being used for comparison – the 1997 or the 2012 standard. Mr. Maietta said that the standard in effect now (the 1997 standard) is the applicable one. The suggestion was made that the 2012 standard be acknowledged since it will be applicable in the very near future. Mr. Maietta stated that he will confirm this when he gets back to the office.

Mr. Pitstick asked if the AADT numbers were high end or low end estimates. Ms. Lovegrove said these were mid-range estimates. Ms. Lovegrove stated that tables 1 and 2 are based on certain segments and present the worst case truck traffic for $PM_{2.5}$.

Mr. Patronsky asked for a table or appendix that documents the origin of MOVES input files, including who provided each file and when it was provided. Mr. Shimizu stated that there is a draft technical report which includes this information. Ms. Lovegrove stated that in the current draft there are electronic files but that it is possible to add tables, so that it will be clear that these files exist and are available in more than one place.

Subsequent to the October 24 meeting the committee met on November 1, 2013. Those attending included: Patricia Berry-CMAP, Bill Barbel-AECOM via phone, Frank Baukert-INDOT via phone, Mitch Barloga-NIRPC via phone, Claire Bozic-CMAP, Teri Dixon-CMAP, John Donovan-FHWA, Gale Ferris-IDEM via phone, Matt Fuller-FHWA via phone, Jim Hargrove via phone, Alice Lovegrove-AECOM via phone, Michael Leslie-US EPA, Kathy Luther-NIRPC via phone, Steve Ott-Parsons Brinckerhoff via phone, Ross Patronsky-CMAP, Mike Rogers-IEPA via phone, Ron Shimizu-Parsons Brinckerhoff via phone, Chris Schmidt-IDOT via phone, Shawn Seals-IDEM via phone, Scott Weber-NIRPC via phone.

The team concurred on a motion from Chris Schmidt and seconded by Mike Rogers that the updated receptor maps submitted by the consultant were adequate. The next meeting was scheduled for November 22, 2013 and subsequently rescheduled for November 15, 2013.

4.0 $PM_{2.5}$ Proposed Designation Boundaries

Mr. Rogers reviewed the Recommended Annual $PM_{2.5}$ Nonattainment Area Designation in Illinois. The proposed nonattainment area boundary designations are out for a 30-day public comment period ending November 12, 2013. The state recommendation to US EPA will be in December 2013; the US EPA designation will be no later than December, 2014. Attainment is to be in 2021.

Mr. Zyznieuski observed that only one monitor in Chicago is over the 12.0 microgram per cubic meter standard and asked whether other counties could be designated as in attainment. Mr. Rogers replied that $PM_{2.5}$ is a regional pollutant as well as a local pollutant, so areas that contribute to the nonattainment status are included as well.

5.0 Tracking Projects of Air Quality Concern (PAQC)

Mr. Zyznieuski stated that the CREATE EW3 freight project could be deleted from the list since a hot spot analysis is not required for freight projects.

In response to a question from Ms. Berry as to whether there had been any recent decisions on projects of air quality concern at District 1/FHWA coordination meetings, Mr. Donovan said he would forward the most recent minutes.

6.0 CREATE East-West Corridor From Argo Interlocking (Cook) to CP509 (Cook) EW-3 Pullman JCT (01-05-0012)- General Conformity Analysis

Ms. Reid asked if Cook County emission rates or project level rates should be used to estimate emission rates for light duty trucks. Mr. Overcast stated that the project includes one truck that is used approximately 960 hours per year. The consultant suggested that the national default emission rates for vehicle types 31 and 32 in Cook County could be used. Mr. Patronsky stated CMAP has no better data for light duty trucks although the age of the truck could be incorporated. Mr. Rogers confirmed that IEPA had no better data. The committee agreed by consensus that the default data could be used.

7.0 Major Capital Project Updates

The committee was reminded that Major Capital Project Updates are available on the Transportation Committee web page.

8.0 Other Business

There was no other business.

9.0 Public Comment

There was no public comment.

10.0 Next Meeting

The next meeting will be on call.

11.0 Adjournment

The meeting was adjourned at 11:51 a.m.

Tier II Consultation Team Members:

	CMAP		FHWA		FTA		IDOT
	IEPA		RTA		USEPA		

References:

1. “CREATE Air Quality Methodology.” Illinois Department of Transportation. April 2011.
2. “Emissions and Emission Factors for Diesel Construction Equipment and Diesel Railroad Maintenance Equipment for the Years 2012-2017.” USEPA. March 2012.
3. “Motor Vehicle Emissions Simulator (MOVES)2010b.” USEPA. June 2012.